CLAIMS

1. An electrical machine comprising a core (10) of a magnetic material, a first insulating layer (14) of a solid electrically insulating material surrounding the core, a high-voltage winding (17) in the form of an electric conductor wound around a first part (16) of the first insulating layer, a field-equalizing member (19) arranged around a second part (18) of the first insulating layer and a second insulating layer (20) of a solid electrically insulating material surrounding the high-voltage winding and the field-equalizing member, wherein the field-equalizing member comprises at least a first sub-member in the form of a winding (27, 28, 37, 38), wherein an electric cable conductor (31) is intended to be connected to the high-voltage winding at the field-equalizing member.

2. An electrical machine according to claim 1, wherein the field-equalizing member (19) comprises a first and a second sub-member in the form of windings (27, 28, 37, 38).

3. An electrical machine according to claim 2, wherein the first sub-member is wound so that it adjoins the outside of the first insulating layer (14), and wherein the second sub-member is wound so that it adjoins the inside of the second insulating layer (20).

4. An electrical machine according to any of claim 2 or 3, wherein said first and second sub-members are individually connected to a ground connection at one end.

5. An electrical machine according to claim 2 or 3, wherein said first and second sub-members are individually connected to the high-voltage winding at one end.

6. An electrical machine according to claim 2 or 3, wherein said first and second sub-members are individually connected to a ground connection at a first end and to the high-voltage winding at a second end.

7. An electrical machine according to any of the preceding claims, which also comprises an electric cable conductor (31) that is surrounded by a third insulating layer (32) of an electrically insulating material, said cable conductor being connected to the high-voltage winding (17) and partly arranged between the first and second insulating layers (14, 20).

8. An electrical machine according to claim 1, wherein the field-equalizing member (19) is inductive.

9. An electrical machine according to any of claims 2-7, wherein the field-equalizing member (19) is inductive.

10. An electrical machine according to claim 9, wherein the number of winding turns for said first and second sub-members is different.

11. An electrical machine according to claim 9 or 10, wherein the number of winding turns for said first and second sub-members is chosen so that the voltage induced across each of the sub-members is the same as across the high-voltage winding (17) when an alternating voltage is applied to the high-voltage winding.

12. An electrical machine according to claims 2-7 or 9-11, wherein said first and second sub-members each comprise a lacquered wire (25, 26).

13. An electrical machine according to claim 1, wherein the field-equalizing member (34) is capacitive.

14. An electrical machine according to claims 2-7, wherein the field-equalizing member (34) is capacitive.

15. An electrical machine according to claim 14, wherein said first and second sub-members each comprise a tape (35, 36) that is wound in overlapping turns so that a capacitive coupling is formed between each turn.

16. An electrical machine according to claim 15, wherein the tapes (35, 36) are wound so that an essentially linear voltage distribution over the length of the sub-members is obtained.

17. An electrical machine according to any of claims 15-16, wherein the tapes (35, 36) comprise an insulating film (41) and a semiconducting film (42).

18. An electrical machine according to claims 15-16, wherein the tapes (35, 36) comprise a metallized film with regular interruptions in the metallization in a longitudinal direction of the film.

19. An electrical machine according to any of the preceding claims, which also comprises a first semiconducting layer (13) that is in contact with and is surrounded by the first insulating layer (14), a second semiconducting layer (15) provided between the first insulating layer and the high-voltage winding (17) in contact with both the first insulating layer and the high-voltage winding, a third semiconducting layer (21) provided between the second insulating layer (20) and the high-voltage winding in contact with both the second insulating layer and the high-voltage winding, and a fourth semiconducting layer (22) that is in contact with and surrounds the second insulating layer.

20. An electrical machine according to any of the preceding claims, which also comprises a flux-shielding member (12) for controlling a magnetic flux in the core (10), said flux-shielding member surrounding the core.

21. An electrical machine according to claim 20, wherein the flux-shielding member (12) is provided between the core (10) and the first insulating layer (14).

22. An electrical machine according to claim 21, wherein the flux-shielding member (12) is provided between the core (10) and the first semiconducting layer (13).

23. An electrical machine according to claims 20-22, wherein the flux-shielding member (12) comprises a tube (44) of an electrically conducting non-magnetic material, in which tube induced currents are formed which prevent the flux from leaking out of the core (43) so that an essentially linear voltage distribution is obtained across the core.

24. An electrical machine according to claim 23, wherein said tube (52) has a slit (53) along a longitudinal axis for the core (43) to avoid short-circuiting of the electrical machine.

25. An electrical machine according to claims 23-24, wherein said tube (44) is of aluminium.

26. An electrical machine according to claim 24, wherein a slit-insulating film (54) is arranged in said slit (53) and an aluminium foil (55) is arranged above said slit and slit-insulating film, the aluminium foil being in contact with the tube on one side of the slit.

27. Use of an electrical machine according to any of the preceding claims as a transformer for transformation of high-voltage into mains voltage.

28. Use of an electrical machine according to claims 1-26, operating under a square voltage.

29. Use according to claim 27, in applications with high-voltage direct current.

30. Use of an electrical machine according to any of the preceding claims, in a reactor for equalizing a voltage.